

Water quality and cyanobacterial management in the Ocklawaha Chain-of-Lakes, Florida

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Introduction

The Ocklawaha Chain-of-Lakes are large, shallow water bodies located in central Florida. These surface waters are naturally productive. However, water quality has been severely degraded by nutrient loading, primarily from large agricultural operations. Water quality in the lakes ranges from mesotrophic to hypereutrophic, and the lakes have experienced prolonged severe cyanobacterial blooms.

Restoration program

The program to manage water quality and cyanobacteria in the lakes includes purchase and restoration of wetland habitat in former agricultural areas to reduce external phosphorus loading, operation of a marsh flow-way to remove particulate phosphorus from lake water, harvesting of gizzard shad to reduce recycling of stored phosphorus, and re-establishment of desirable aquatic vegetation.

Lake responses

There are strong relationships between external phosphorus loading, phosphorus concentrations, and cyanobacterial biovolume in the Ocklawaha Chain-of-Lakes. Following external phosphorus load reduction and shad harvesting, Lake Griffin has seen substantial improvements in water quality, including decreases in phosphorus and chlorophyll concentrations, and increases in transparency. Cyanobacterial biovolume has also decreased, and there have been changes in the composition, including a decrease in dominance by *Cylindrospermopsis*. The phytoplankton community has shifted from year-round cyanobacterial dominance to cyanobacterial dominance only during the warm season.

Conclusion

Data indicate that meeting phosphorus targets for the lakes will significantly improve water quality. Cyanobacteria likely will remain seasonally dominant even if phosphorus reduction goals are achieved, although at substantially lower biovolume.